

MATERIAL SAFETY DATA SHEET

MSDS drafted in accordance with Art. 31 of amended EC regulation No. 1907/2006 dated 18.12.2006

1. Identification of the mixture and the company

- 1.1. Commercial name: **EXEM 100**
- 1.2. Application: EXPLOSIVE mainly used in quarries, mines and public works sites
- 1.3. Supplier: Manufacturer: EPC-FRANCE, 4 rue de St Martin 13310 St Martin de Crau (France)
Tel.: (00 33) (0)4 90 47 17 25 Email: dqs@epc-france.com
- 1.4. Emergency call number of the approved body: (33) (0)1 45 42 59 59 (ORFILA)

2. Identification of hazards

2.1. Mixture classification

Explosive E, R2
Irritant Xi, R36

2.2. Labelling elements

Exempt by Article 12 of Directive 1999/45/EC

2.3. Other hazards

During transport, storage and handling: May explode if exposed to intense heat, heavy shocks, significant friction or intense electrical discharge.

The detonation will propagate immediately into the entire mass and may be transmitted to other explosive charges in the vicinity.

Will cause skin irritation in case of prolonged contact with the product after accidental leakage from the container.

Intoxication in case of inhalation of the fumes produced during the combustion or detonation.

Detonation in case of excessive temperature during heap combustion.

Projection of solid bodies present in the vicinity of the exploding charge.

3. Composition / Information on components

Emulsion (water/oil type) composed of aqueous solutions of Ammonium nitrate with other oxidisers, in oil phase comprising oils - waxes - surface active agent. Also contains aluminium powder.

Substances	EC No.	CAS No	Registration No	Classification 67/548/CE	Classification 1272/2008	Concentration
Ammonium nitrate	229-347-8	6484-52-2	01-2119490981-27-	O, R8; Xi, R36	Ox. Liq.3, H272 Eye Dam./Irrit.2, H319	50-70%
Sodium nitrate	231-554-3	7631-99-4	01-2119488221-41-	O ; R8	Ox. Liq.2, H272 Eye Dam./Irrit.2, H319	5-20%
Sodium perchlorate	231-511-9	7601-89-0	01-2119540521-50-	O, R8; Xi, R36; Xn, R22; Xn, R48/R22		< 10%



4. First aid

4.1. Description of first aid measures

Contact with skin: Wash immediately with plenty of water. Wash contaminated clothes before reuse.

Contact with eyes: Flush immediately with plenty of water. Check whether victim is wearing contact lenses; if so, remove them. Seek advice from an ophthalmologist.

If swallowed: Do not give anything to drink. If large quantities have been swallowed, do not induce vomiting. Seek medical advice or contact the poison control centre.

Inhalation of combustion or detonation fumes: See paragraph 5.

5. Fire-fighting measures

5.1. Fire extinguishing means

Use available fire extinguishers and spraying systems.

Use of water or multi-purpose powder is recommended for fire-fighting (in case of aluminium combustion).

5.2. Specific hazards resulting from the mixture

Product, depot or truck on fire: Do not try to extinguish the fire, evacuate the hazardous area immediately and move all personnel to a safe place sheltered from the effects of an explosion. Isolate the area and report the risk of explosion to local authorities.

In addition to the explosion hazard, in case of fire, fumes may be released with emission of harmful gases (nitrogen oxides and carbon monoxide).

5.3. Advice to fire-fighting personnel

Immediately report the explosion hazard to local authorities and fire-fighting personnel.

If the fire reaches the packaging, go away from the area, evacuate immediately all persons in the vicinity and isolate the area in question. Go to a safe distance and/or to a safe place.

Use powerful streams of water in safe position. If this can be done without risks, move the emulsion containers away before they are reached by the fire.

Protection of fire-fighting personnel: Wear isolating breathing apparatuses due to possible release of harmful gases (nitrogen oxides and carbon monoxide).

6. Measures to be taken in case of accidental spillage

6.1. Individual precautions, protective equipment and emergency procedures

Avoid shocks, friction and everything which may cause a spark. Move all sources of heat and naked flames away, move other pyrotechnical or flammable materials away. Wash hands immediately in case of contact.

6.2. Precautions for environmental protection

Do not dispose of in sewers or in the natural environment.

Do not dispose of with garbage or in a waste dump or a furnace.

6.3. Containment and cleaning methods and equipment

Wear rubber gloves, recover spilled products and put them in plastic bags. Do not mix the products in particular with initiating devices. Close the bags with adhesive tape or elastic bands and put them in cardboard boxes with adhesive tape.

During transport or handling: Inform the manufacturer, its representative or the consignee who are the only ones authorised for waste disposal.

On operations site: Recover explosive products, place them in plastic bags, as indicated above, and hand products over to the blaster who will comply with the destruction procedure set forth by the works site instructions.

Do not store with flammable products or initiating devices. Store in accordance with paragraph 7.2.

Dispose of as indicated in Point 14. If in doubt, seek information from expert personnel or the supplier.

7. Handling and storage

7.1. Precautions to be taken for safe handling

Do not smoke or ignite naked flames in the vicinity of the products.

Handle explosive emulsions with care, avoid shocks and contact with heat sources.

Do not open packages inside depots or on handling areas.

Avoid contamination of the products.

Use antistatic and spark-proof tools and accessories.



Check preservation condition before use. In case of anomalies, the explosive emulsions must not be used, they must be returned to the supplier or destroyed under supplier's supervision.

- 7.2. Safe storage conditions, including incompatibility (if any)
Do not exceed authorised quantities.
Only store together products from the same compatibility group or from compatible groups.
Do not store with flammable products or initiating devices.
Only store in a perfectly ventilated place with average temperature not exceeding 35 to 40°C. Storage remains safe up to a temperature of 65°C, the product can only harden. In such a case, contact our technical department.
Smoking and lighting a fire in a storage place are strictly prohibited.
- 7.3. Specific final use
Do not use beyond the shelf life.
Do not cut the cartridges.

8. Exposure control / Personal protection

- 8.1. Control parameters
There is no occupational exposure limit (OEL) for the substances of the mixture.
- 8.2. Exposure control
Respiratory tract protection: Not necessary.
Hand protection: All handling operations must be carried out with plastic material, rubber or leather gloves.
Eye protection: Protective goggles are strongly recommended to prevent any possible splashes into the eyes should the cartridge envelope break.

9. Physical and chemical properties

- 9.1. Information on main physical and chemical properties
Physical state: Grey plastic emulsion
Odour: Odourless
Odour threshold: Unknown
pH: 5.8 (dilution to 10%)
Melting point: Not applicable
Boiling point: Not applicable
Flash point: Not applicable
Evaporation rate: Not available
Flammability: Not available
Upper/Lower flammability limits: Not available
Vapour pressure, Vapour density: Not available
Relative density: 1.27
Solubility: Not soluble
Partition coefficient (n-octanol/water): Not available
Viscosity : >3,000,000 cPs
Explosive properties
Shock sensitivity: No reaction at 50 J (Dry explosive: Reaction at 28.6 J)
Friction sensitivity: No reaction at 353 N (Dry explosive: No reaction at 353 N).

10. Stability and reactivity

- 10.1. Reactivity
Shock and friction sensitivity increases in case of presence of hard materials (dust, sand, etc.).
Risk of explosion in case of heavy shocks or friction on material in confined state.
Explosion hazard, in case of confinement, under the effect of sudden increase in the temperature (for example: a fire).
Risk of instant transmission to the entire explosive mass.
The sensitivity of the dry product is higher than that of the original product.
- 10.2. Chemical stability
In normal storage conditions, the product is chemically stable.
The recommended shelf life is one year. Beyond that time, the product will not be more dangerous but its reliability of use is no longer guaranteed. It may be re-qualified.



The limits for use of the product are described in the technical data sheets.
Recommended climatic conditions for use: From -10°C to +60°C.

10.3. Conditions to be avoided

Refer to explosive properties related to shock and friction sensitivity.

10.4. Incompatible materials

Avoid contact with alkalis, amines, strong acids, alkali metals, copper, zinc.
Store only with Class 1.1.D or 1.4.S products.

10.5. Hazardous decomposition products

Combustion or explosion fumes contain carbon oxides (CO_x) and nitrogen oxides (NO_x).

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity

The mixture is not classified as harmful by the conventional method.

No evaluation has been carried out on the mixture.

Component name	Result / Route	Species	Doses	Remarks
Ammonium nitrate	LD50, Oral route	Rat	2,950 mg/kg	IUCLID 5
Ammonium nitrate	LD50, Dermal route	Rat	>5,000 mg/kg	IUCLID 5
Sodium nitrate	LD50, Oral route	Rat	3,430 mg/kg	OECD Test Guideline 401
Sodium nitrate	LD50, Dermal route	Rat	>5,000 mg/kg	OECD Test Guideline 402. Information is from products of similar structure or composition.

Conclusion/Summary: No significant effect or critical hazard known.

Irritation/Corrosion

Component name	Result / Route	Species	Doses	Remarks
Ammonium nitrate	Eyes - Irritating	Rabbit		IUCLID 5

Conclusion/Summary: **Eyes:** Causes severe eye irritation.

Respiratory tract: May cause respiratory tract irritation.

12. Ecological information

12.1. Toxicity

Ammonium nitrate	Result	Species	Exposure	References
Acute toxicity, LC50	447 mg/l, Fresh water	Fish	48 hours	IUCLID 5
Acute toxicity, EC50	490 mg/l, Fresh water	Daphnia	48 hours	IUCLID 5
Acute toxicity, EC50	1,700 mg/l, Salt water	Aquatic plants	10 days	IUCLID 5

Sodium nitrate	Result	Species	Exposure	References
Acute toxicity, LC50	7,950 mg/l	Oncorhynchus tshawytscha	96 hours	Static
Acute toxicity, EC50	8,609 mg/l	Daphnia (Daphnia Magna)	24 hours	Static
Acute toxicity, EC10	180 mg/l	Microorganisms	3 hours	Domestic activated sludge, OECD Test Guideline 209, aquatic



Sodium perchlorate	Result	Species	Exposure	References
Acute toxicity, LC50	1,000 mg/l	Zebrafish (Danio rerio)		OECD method, Test Guideline 203, pH 7.3-8.0
Acute toxicity, EC50	>100 mg/l	Daphnia (Daphnia Magna)	48 hours	OECD method, Test Guideline 202, pH 7.6-7.7
Acute toxicity, Cl r50	>436 mg/l	Green algae (Pseudokirchneriella subcapitata)	72 hours	OECD method, Test Guideline 201, Growth inhibition
Acute toxicity, EC50	>1,000 mg/l	Bacteria	3 hours	
NOEC	10 mg/l	Zebrafish (Danio rerio)	84 days	pH 6.5-8.0
NOEC	12 mg/l	Cerodaphnia dubia	7 days	
LC 50	4.45 mg/kg	Elsenia fetida (earthworms)	14 days	OECD method, Test Guideline 207

12.2. Persistence and degradability

Sodium perchlorate: Not biodegradable in water.

12.3. Bioaccumulation potential

Ammonium nitrate: Not available.

Sodium perchlorate: Not applicable. Bioconcentration factor (BCF): 0.35 (OECD Method, Test Guideline 305, Fish - Test substance: active material).

12.4. Land mobility

Ammonium nitrate: Not available.

Sodium perchlorate: Absorption/desorption: log Koc <2

12.5. Results of the PBT and vPvB assessments

Ammonium nitrate, sodium nitrate and sodium perchlorate: These substances do not comply with the PBT and vPvB criteria of Annex XIII of the REACH Regulation.

13. Disposal information

The use of an emulsion does not generate any other waste than the cardboard boxes and polythene bags which must be destroyed in accordance with the regulations in force.

Never dispose of residues in garbage bin or in rubbish dump. Destroy residues in approved facilities.

Treatment of waste after accidental spillage is dealt with in paragraph VI.

Contact the supplier's distribution depot to know the recovery conditions.

Packages contaminated with explosive traces shall be examined carefully to make sure they are empty and laid flat. They may be either burned on the place of use (if the facility is approved) or returned to the supplier in accordance with the conditions defined.

14. Transport information

Authorisation and classification.

CLASSIFICATION FOR TRANSPORT	EXEM 100
ADR	Mining explosive (blasting), type E 1,1 D No. 0241
MARITIME (IMDG)	1,1 D UN 0241
NOMENCLATURE (Customs)	360200000009G





15. Regulatory information

Main legislative, regulatory and administrative texts

1) Protection of workers

Occupational disease: ● Not applicable

2) Protection of population

Acquisition, transfer and use are subject to the French Defence Code.

3) Protection against theft and mysterious disappearance of explosive products

- Decree No. 80-1022 of 15 December 1980.

4) Use of explosive products

General regulations applicable to mining and quarrying

- Amended Decree No. 80-331 of 7 May 1980 (General regulations for mining and quarrying)

Storage of explosive products

- Environment Code, Rubric 1311 concerning storage of explosives.
- Decree No. 79-846 Article 14 and Order of 20 April 2007 concerning isolation distances for storage of explosive products.

5) Environmental protection

- Environment Code.

6) Transport

- Recommendations on the transport of dangerous goods (United Nations).
- European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). Modified order dated 21 May 2009 concerning land transport of dangerous materials ("TMD Order").
- International Maritime Dangerous Goods Code (IMDG).

This very partial list only indicates the basic legislative, regulatory and administrative texts. It shall not be considered as an exhaustive list and does not exempt the user from making sure that no other obligations fall on him/her, pursuant to texts other than those mentioned, concerning the possession and handling of the product for which he/she is solely responsible.

16. Other information

Hazard symbols:

E	Explosive
O	Oxidising
Xn	Harmful
Xi	Irritant

“R” phrases

R2	Risk of explosion by shock, friction, fire or other sources of ignition.
R22	Harmful if swallowed.
R36	Irritating to eyes.
R48/22	Harmful: danger of serious damage to health by prolonged exposure if swallowed.

S phrases - Safety advice concerning dangerous substances and preparations (Directive 2001/59/EC of 6 August 2001)

S24	Avoid contact with skin.
S35	This material and its container must be disposed of in a safe way.
S37	Wear suitable gloves.
S40	To clean the floor and all objects contaminated by this material, use suitable tools (spark-proof or wooden tools).
S41	In case of fire and/or explosion do not breathe fumes.

Acronyms and abbreviations

UN	United Nations Organisation
ADR	Agreement for Dangerous materials transported by Road
IMDG	International Maritime Dangerous Goods Code



This MSDS completes the technical instructions for use but does not replace them. The information contained herein is based on our knowledge of the product on the date indicated. It is provided in good faith. Furthermore, we would like to draw users' attention to the possible risks involved in using a product for any purpose other than that for which it is intended.

This MSDS shall on no account exempt the user from finding out and applying all regulatory texts concerning his/her activity. The user shall be solely responsible for taking all necessary precautions regarding the use of the product.

It is the user's responsibility to:

- define safety measures concerning all cases of use of the product, taking into account, notably, the data contained in this MSDS.
- inform all users and handlers of the appropriate safety data and the precautions concerning the risks mentioned in any document relating to the use of the product.

Our technical services are available to users to provide assistance, as far as possible and according to their knowledge. Changes and additions with respect to previous version are in italics.